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FILE 'WPIDS' ENTERED AT 18:56:36 ON 20 JUL 2004  
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=> s luciferase (10a) (firefly or luciola)  
L1 11631 LUCIFERASE (10A) (FIREFLY OR LUCIOLA)

=> s l1 (5a) (muta? or variant)  
10 FILES SEARCHED...  
L2 356 L1 (5A) (MUTA? OR VARIANT)

=> dup rem l2  
PROCESSING COMPLETED FOR L2  
L3 128 DUP REM L2 (228 DUPLICATES REMOVED)

=> s l2 and 490  
L4 1 L2 AND 490

=> d

L4 ANSWER 1 OF 1 HCAPLUS COPYRIGHT 2004 ACS on STN  
AN 1999:464101 HCAPLUS  
DN 131:84835  
TI Luciferase mutants resistant to surfactants and use for determination of  
intracellular ATP  
IN Hattori, Noriaki; Murakami, Seiji  
PA Kikkoman Corporation, Japan  
SO PCT Int. Appl., 56 pp.  
CODEN: PIXXD2  
DT Patent  
LA Japanese  
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 9933997	A1	19990708	WO 1998-JP5864	19981224
	W: AU, CA, US				
	RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL,				
	PT, SE				
	JP 11239493	A2	19990907	JP 1998-363108	19981221

AU 9916883            A1    19990719            AU 1999-16883        19981224  
 EP 1041151            A1    20001004            EP 1998-961523       19981224  
       R: DE, GB, NL  
 PRAI JP 1997-361022    A    19971226  
       WO 1998-JP5864    W    19981224  
 RE.CNT 13        THERE ARE 13 CITED REFERENCES AVAILABLE FOR THIS RECORD  
                  ALL CITATIONS AVAILABLE IN THE RE FORMAT

=> s l2 and atp  
 L5                94 L2 AND ATP

=> s l5 not l4  
 L6                93 L5 NOT L4

=> dup rem l6  
 PROCESSING COMPLETED FOR L6  
 L7                38 DUP REM L6 (55 DUPLICATES REMOVED)

=> d 1-10

L7    ANSWER 1 OF 38            MEDLINE on STN                            DUPLICATE 1  
 AN    2004088756            MEDLINE  
 DN    PubMed ID: 14670952  
 TI    Relationship between growth rate and **ATP** concentration in  
       Escherichia coli: a bioassay for available cellular **ATP**.  
 AU    Schneider David A; Gourse Richard L  
 CS    Department of Bacteriology, University of Wisconsin, Madison, Wisconsin  
       53706, USA.  
 NC    R01 GM37048 (NIGMS)  
 SO    Journal of biological chemistry, (2004 Feb 27) 279 (9) 8262-8.  
       Journal code: 2985121R. ISSN: 0021-9258.  
 CY    United States  
 DT    Journal; Article; (JOURNAL ARTICLE)  
 LA    English  
 FS    Priority Journals  
 EM    200405  
 ED    Entered STN: 20040224  
       Last Updated on STN: 20040505  
       Entered Medline: 20040503

L7    ANSWER 2 OF 38    LIFESCI        COPYRIGHT 2004 CSA on STN DUPLICATE 2  
 AN    2003:64587    LIFESCI  
 TI    Creation of a Thermostable Firefly Luciferase with pH-insensitive  
       Luminescent Color  
 AU    Kitayama, A.; Yoshizaki, H.; Ohmiya, Y.; Ueda, H.; Nagamune, T.  
 CS    Department of Chemistry and Biotechnology, School of Engineering,  
       University of Tokyo, Tokyo, Japan; E-mail: h-ueda@k.u-tokyo.ac.jp  
 SO    Photochemistry and Photobiology [Photochem. Photobiol.], (20030300) vol.  
       77, no. 3, pp. 333-338.  
       ISSN: 0031-8655.  
 DT    Journal  
 FS    G  
 LA    English  
 SL    English

L7    ANSWER 3 OF 38    BIOSIS    COPYRIGHT 2004 BIOLOGICAL ABSTRACTS INC. on STN  
       DUPLICATE 3  
 AN    2003:464149    BIOSIS  
 DN    PREV200300464149  
 TI    Enhanced microbial biomass assay using mutant luciferase resistant to  
       benzalkonium chloride.  
 AU    Hattori, Noriaki [Reprint Author]; Sakakibara, Tatsuya; Kajiyama, Naoki;  
       Igarashi, Toshinori; Maeda, Masako; Murakami, Seiji

CS Research and Development Division, Kikkoman Corp., 399 Noda, Noda City,  
Chiba Pref., 278-0037, Japan  
8345@mail.kikkoman.co.jp  
SO Analytical Biochemistry, (August 15 2003) Vol. 319, No. 2, pp. 287-295.  
print.  
ISSN: 0003-2697 (ISSN print).  
DT Article  
LA English  
ED Entered STN: 8 Oct 2003  
Last Updated on STN: 8 Oct 2003

L7 ANSWER 4 OF 38 BIOSIS COPYRIGHT 2004 BIOLOGICAL ABSTRACTS INC. on STN  
AN 2003:531136 BIOSIS  
DN PREV200300533721  
TI Measurement of free **ATP** concentration in vivo and the role of  
initiating NTP concentration in transcription initiation.  
AU Schneider, D. A. [Reprint Author]; Gourse, R. L. [Reprint Author]  
CS University of Wisconsin-Madison, Madison, WI, USA  
SO Abstracts of the General Meeting of the American Society for Microbiology,  
(2003) Vol. 103, pp. H-072. <http://www.asmta.org/mtgsrc/generalmeeting.htm>.  
cd-rom.  
Meeting Info.: 103rd American Society for Microbiology General Meeting.  
Washington, DC, USA. May 18-22, 2003. American Society for Microbiology.  
ISSN: 1060-2011 (ISSN print).  
DT Conference; (Meeting)  
Conference; Abstract; (Meeting Abstract)  
LA English  
ED Entered STN: 12 Nov 2003  
Last Updated on STN: 12 Nov 2003

L7 ANSWER 5 OF 38 MEDLINE on STN DUPLICATE 4  
AN 2002424703 MEDLINE  
DN PubMed ID: 12181344  
TI Overexpression of yeast Hsp110 homolog Sse1p suppresses ydj1-151  
thermosensitivity and restores Hsp90-dependent activity.  
AU Goeckeler Jennifer L; Stephens Andi; Lee Paul; Caplan Avrom J; Brodsky  
Jeffrey L  
CS Department of Biological Sciences, University of Pittsburgh, Pennsylvania  
15260, USA.  
SO Molecular biology of the cell, (2002 Aug) 13 (8) 2760-70.  
Journal code: 9201390. ISSN: 1059-1524.  
CY United States  
DT Journal; Article; (JOURNAL ARTICLE)  
LA English  
FS Priority Journals  
EM 200304  
ED Entered STN: 20020816  
Last Updated on STN: 20030410  
Entered Medline: 20030409

L7 ANSWER 6 OF 38 MEDLINE on STN DUPLICATE 5  
AN 2003085153 MEDLINE  
DN PubMed ID: 12596852  
TI **Mutant luciferase** enzymes from **fireflies**  
with increased resistance to benzalkonium chloride.  
AU Hattori Noriaki; Kajiyama Naoki; Maeda Masako; Murakami Seiji  
CS Research and Development Division, Kikkoman Corporation, 399 Noda, Noda  
city, Chiba pref. 278-0037, Japan.. 8345@mail.kikkoman.co.jp  
SO Bioscience, biotechnology, and biochemistry, (2002 Dec) 66 (12) 2587-93.  
Journal code: 9205717. ISSN: 0916-8451.  
CY Japan  
DT Journal; Article; (JOURNAL ARTICLE)  
LA English  
FS Priority Journals

EM 200308  
ED Entered STN: 20030225  
Last Updated on STN: 20030813  
Entered Medline: 20030812

L7 ANSWER 7 OF 38 HCAPLUS COPYRIGHT 2004 ACS on STN  
AN 2003:108853 HCAPLUS  
DN 139:319073  
TI Novel in vivo reporters based on firefly luciferase  
AU White, P. J.; Leslie, R. L.; Lingard, B.; Williams, J. R.; Squirrell, D. J.  
CS Dstl, Chemical and Biological Sciences, Salisbury, Wiltshire, SP4 0JQ, UK  
SO Bioluminescence & Chemiluminescence: Progress & Current Applications, [Proceedings of the Symposium on Bioluminescence and Chemiluminescence], 12th, Cambridge, United Kingdom, Apr. 5-9, 2002 (2002), 509-512. Editor(s): Stanley, Philip E.; Kricka, Larry J. Publisher: World Scientific Publishing Co. Pte. Ltd., Singapore, Singapore. CODEN: 69DPGZ; ISBN: 981-238-156-2  
DT Conference  
LA English  
RE.CNT 1 THERE ARE 1 CITED REFERENCES AVAILABLE FOR THIS RECORD  
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L7 ANSWER 8 OF 38 HCAPLUS COPYRIGHT 2004 ACS on STN  
AN 2003:210584 HCAPLUS  
DN 139:129845  
TI Catalytic properties and bioluminescence spectra of recombinant **luciferase** of fire-fly **Luciola** mingrelica with point **mutations** outside of active site  
AU Maloshenok, L. G.; Uporov, I. V.; Ugarova, N. N.  
CS Kafedra Khim. Enzimol., Khim. Fak., Mosk. Gos. Univ. im. M. V. Lomonosova, Moscow, Russia  
SO Vestnik Moskovskogo Universiteta, Seriya 2: Khimiya (2002), 43(6), 359-362  
CODEN: VMUKA5; ISSN: 0579-9384  
PB Izdatel'stvo Moskovskogo Universiteta  
DT Journal  
LA Russian

L7 ANSWER 9 OF 38 MEDLINE on STN DUPLICATE 6  
AN 2002303453 MEDLINE  
DN PubMed ID: 12044905  
TI Improved practical usefulness of **firefly luciferase** by gene chimerization and random **mutagenesis**.  
AU Hirokawa Kozo; Kajiyama Naoki; Murakami Seiji  
CS Research and Development Division, Kikkoman Corporation, 399 Noda, Chiba Prefecture 278-0037, Japan.. khirokawa@mail.kikkoman.co.jp  
SO Biochimica et biophysica acta, (2002 Jun 3) 1597 (2) 271-9. Journal code: 0217513. ISSN: 0006-3002.  
CY Netherlands  
DT Journal; Article; (JOURNAL ARTICLE)  
LA English  
FS Priority Journals  
EM 200207  
ED Entered STN: 20020605  
Last Updated on STN: 20020725  
Entered Medline: 20020724

L7 ANSWER 10 OF 38 SCISEARCH COPYRIGHT 2004 THOMSON ISI on STN  
AN 2002:520740 SCISEARCH  
GA The Genuine Article (R) Number: 563PD  
TI Improved practical usefulness of **firefly luciferase** by gene chimerization and random **mutagenesis**  
AU Hirokawa K (Reprint); Kajiyama N; Murakami S  
CS Kikkoman Foods Inc, Div Res & Dev, 399 Noda, Noda, Chiba 2780037, Japan

(Reprint); Kikkoman Foods Inc, Div Res & Dev, Noda, Chiba 2780037, Japan  
CYA Japan  
SO BIOCHIMICA ET BIOPHYSICA ACTA-PROTEIN STRUCTURE AND MOLECULAR ENZYMOLOGY,  
(3 JUN 2002) Vol. 1597, No. 2, pp. 271-279.  
Publisher: ELSEVIER SCIENCE BV, PO BOX 211, 1000 AE AMSTERDAM,  
NETHERLANDS.  
ISSN: 0167-4838.  
DT Article; Journal  
LA English  
REC Reference Count: 26  
\*ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS\*

=> d 11-20

L7 ANSWER 11 OF 38 HCAPLUS COPYRIGHT 2004 ACS on STN  
AN 2003:108767 HCAPLUS  
DN 139:334753  
TI Catalytic properties and bioluminescence spectra of recombinant  
**firefly luciferase Luciola mingrelica** with  
point **mutations** out of the enzyme active site  
AU Maloshenok, L. G.; Ugarova, N. N.  
CS Dept of Chemistry, Lomonosov Moscow State University, Moscow, 119899,  
Russia  
SO Bioluminescence & Chemiluminescence: Progress & Current Applications,  
[Proceedings of the Symposium on Bioluminescence and Chemiluminescence],  
12th, Cambridge, United Kingdom, Apr. 5-9, 2002 (2002), 45-48. Editor(s):  
Stanley, Philip E.; Kricka, Larry J. Publisher: World Scientific  
Publishing Co. Pte. Ltd., Singapore, Singapore.  
CODEN: 69DPGZ; ISBN: 981-238-156-2  
DT Conference  
LA English  
RE.CNT 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD  
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L7 ANSWER 12 OF 38 HCAPLUS COPYRIGHT 2004 ACS on STN  
AN 2003:108764 HCAPLUS  
DN 139:334659  
TI Structural study of Photinus pyralis firefly luciferase using fluorescence  
AU Gandelman, O. A.; Tisi, L. C.; Lowe, C. R.; Murray, J. A. H.  
CS Institute of Biotechnology, University of Cambridge, Cambridge, CB2 1QT,  
UK  
SO Bioluminescence & Chemiluminescence: Progress & Current Applications,  
[Proceedings of the Symposium on Bioluminescence and Chemiluminescence],  
12th, Cambridge, United Kingdom, Apr. 5-9, 2002 (2002), 33-36. Editor(s):  
Stanley, Philip E.; Kricka, Larry J. Publisher: World Scientific  
Publishing Co. Pte. Ltd., Singapore, Singapore.  
CODEN: 69DPGZ; ISBN: 981-238-156-2  
DT Conference  
LA English  
RE.CNT 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD  
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L7 ANSWER 13 OF 38 BIOSIS COPYRIGHT 2004 BIOLOGICAL ABSTRACTS INC. on STN  
AN 2001:440118 BIOSIS  
DN PREV200100440118  
TI Enzyme assay for **mutant firefly luciferase**.  
AU Squirrell, David James [Inventor, Reprint author]; White, Peter John  
[Inventor]; Lowe, Christopher Robin [Inventor]; Murray, James Augustus  
Henry [Inventor]  
CS Salisbury, UK  
ASSIGNEE: The United States of America as represented by the Secretary of  
the State of Defence, Washington, DC, USA  
PI US 6265177 July 24, 2001

SO Official Gazette of the United States Patent and Trademark Office Patents,  
(July 24, 2001) Vol. 1248, No. 4. e-file.  
CODEN: OGUPE7. ISSN: 0098-1133.  
DT Patent  
LA English  
ED Entered STN: 19 Sep 2001  
Last Updated on STN: 22 Feb 2002

L7 ANSWER 14 OF 38 HCAPLUS COPYRIGHT 2004 ACS on STN  
AN 2001:66974 HCAPLUS  
DN 134:218896  
TI The role of active site residue arginine 218 in firefly luciferase  
bioluminescence  
AU Branchini, Bruce R.; Magyar, Rachelle A.; Murtiashaw, Martha H.; Portier,  
Nathan C.  
CS Department of Chemistry, Connecticut College, New London, CT, 06320, USA  
SO Biochemistry (2001), 40(8), 2410-2418  
CODEN: BICHAW; ISSN: 0006-2960  
PB American Chemical Society  
DT Journal  
LA English  
RE.CNT 54 THERE ARE 54 CITED REFERENCES AVAILABLE FOR THIS RECORD  
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L7 ANSWER 15 OF 38 SCISEARCH COPYRIGHT 2004 THOMSON ISI on STN  
AN 2002:302797 SCISEARCH  
GA The Genuine Article (R) Number: 535RA  
TI Relationship between the structure of the protein globule and  
bioluminescence spectra of firefly luciferase  
AU Ugarova N N (Reprint); Brovko L Y  
CS Moscow MV Lomonosov State Univ, Dept Chem, Moscow 119899, Russia  
(Reprint); Univ Guelph, Dept Food Sci, Guelph, ON N1G 2W1, Canada  
CYA Russia; Canada  
SO RUSSIAN CHEMICAL BULLETIN, (OCT 2001) Vol. 50, No. 10, pp. 1752-1761.  
Publisher: CONSULTANTS BUREAU, 233 SPRING ST, NEW YORK, NY 10013 USA.  
ISSN: 1066-5285.  
DT General Review; Journal  
LA English  
REC Reference Count: 42  
\*ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS\*

L7 ANSWER 16 OF 38 LIFESCI COPYRIGHT 2004 CSA on STN  
AN 2002:27771 LIFESCI  
TI Enzyme assay for **mutant firefly luciferase**  
AU Squirrell, D.J.; White, P.J.; Lowe, C.R.; Murray, J.A.H.  
CS The United States of America as represented by the Secretary of the State  
SO (20010724) . US Patent: 6265177; US CLASS: 435/8; 435/189; 435/252.3;  
435/320.1; 435/440; 435/810; 536/23.2.  
DT Patent  
FS W2  
LA English  
SL English

L7 ANSWER 17 OF 38 HCAPLUS COPYRIGHT 2004 ACS on STN  
AN 2000:236330 HCAPLUS  
DN 132:290463  
TI The role of lysine 529, a conserved residue of the acyl-adenylate-forming  
enzyme superfamily, in firefly luciferase  
AU Branchini, Bruce R.; Murtiashaw, Martha H.; Magyar, Rachelle A.; Anderson,  
Shannon M.  
CS Department of Chemistry, Connecticut College, New London, CT, 06320, USA  
SO Biochemistry (2000), 39(18), 5433-5440  
CODEN: BICHAW; ISSN: 0006-2960  
PB American Chemical Society

DT Journal  
LA English

RE.CNT 30 THERE ARE 30 CITED REFERENCES AVAILABLE FOR THIS RECORD  
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L7 ANSWER 18 OF 38 HCAPLUS COPYRIGHT 2004 ACS on STN  
AN 2000:807421 HCAPLUS  
DN 134:127593  
TI Knock-out firefly luciferases and their potential technological applications  
AU Ispas, G.; Famelaer, I.; Decanniere, K.; D'Haeseleer, M.; Jacobs, M.  
CS Laboratory of Plant Genetics, Vrije Universiteit Brussel, Sint Genesius Rode, B-1640, Belg.  
SO Mededelingen - Faculteit Landbouwkundige en Toegepaste Biologische Wetenschappen (Universiteit Gent) (2000), 65(3b), 615-618  
CODEN: MFLBER; ISSN: 1373-7503  
PB Universiteit Gent, Faculteit Landbouwkundige en Toegepaste Biologische Wetenschappen  
DT Journal; General Review  
LA English  
RE.CNT 3 THERE ARE 3 CITED REFERENCES AVAILABLE FOR THIS RECORD  
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L7 ANSWER 19 OF 38 BIOTECHDS COPYRIGHT 2004 THOMSON DERWENT/ISI on STN  
AN 1999-07862 BIOTECHDS  
TI New mutant luciferase enzymes with increased stability;  
from Photuris pennsylvania, used for **ATP** assay, luminescent marker and genetic reporter, etc.  
AU Wood K V; Hall M P  
PA Promega  
LO Madison, WI, USA.  
PI WO 9914336 25 Mar 1999  
AI WO 1998-US19494 18 Sep 1998  
PRAI US 1997-59379 19 Sep 1997  
DT Patent  
LA English  
OS WPI: 1999-229538 [19]

L7 ANSWER 20 OF 38 MEDLINE on STN DUPLICATE 7  
AN 2000076476 MEDLINE  
DN PubMed ID: 10608870  
TI Functional defects of the DnaK756 mutant chaperone of Escherichia coli indicate distinct roles for amino- and carboxyl-terminal residues in substrate and co-chaperone interaction and interdomain communication.  
AU Buchberger A; Gassler C S; Buttner M; McMacken R; Bukau B  
CS Institut für Biochemie und Molekularbiologie, Universität Freiburg, Hermann Herder Strasse 7, D-79104 Freiburg, Germany.  
NC GM36526 (NIGMS)  
SO Journal of biological chemistry, (1999 Dec 31) 274 (53) 38017-26.  
Journal code: 2985121R. ISSN: 0021-9258.  
CY United States  
DT Journal; Article; (JOURNAL ARTICLE)  
LA English  
FS Priority Journals  
EM 200002  
ED Entered STN: 20000218  
Last Updated on STN: 20000218  
Entered Medline: 20000208

=> d 11 ab

L7 ANSWER 11 OF 38 HCAPLUS COPYRIGHT 2004 ACS on STN  
AB The mutants His433Asn and His433Ser were constructed for the Luciola

mingrellica firefly luciferase, which has high homol. with luciferases indicated. The catalytic properties of the enzyme mutant forms and their bioluminescence spectra were studied. Anal. of the data obtained permits the elucidation of the mechanism of the influence of the His-433 residue on the luciferase active site. The comparison of the bioluminescence spectra of the wild type and mutant luciferases demonstrates that the bioluminescence maximum coincides for all three proteins and is equal to 562-564 nm. On the His433Ser mutation, the removal of the His pos. charge and the appearance of the partial neg. charge from Ser lead to destabilization of the cluster, and the neg. side chains of the surrounding residues may slightly move away from each other. In this case, some changes in the configuration of the **ATP** phosphate groups may occur that may be the reason for such a dramatic decrease in the catalytic activity of the His433Ser mutant. Thus, in spite of the fact that the His-433 residue is located rather far from the luciferase active site, its change for Ser results in the noticeable changes in physico-chemical and catalytic properties of the enzyme due to the rather small structural changes in the enzyme-substrate complex.

=> d 21-30

L7 ANSWER 21 OF 38 MEDLINE on STN DUPLICATE 8  
 AN 1999459270 MEDLINE  
 DN PubMed ID: 10529195  
 TI Site-directed **mutagenesis** of **firefly luciferase** active site amino acids: a proposed model for bioluminescence color.  
 AU Branchini B R; Magyar R A; Murtiashaw M H; Anderson S M; Helgersson L C; Zimmer M  
 CS Department of Chemistry, Connecticut College, New London 06320, USA.. brbra@conncoll.edu  
 SO Biochemistry, (1999 Oct 5) 38 (40) 13223-30.  
 Journal code: 0370623. ISSN: 0006-2960.  
 CY United States  
 DT Journal; Article; (JOURNAL ARTICLE)  
 LA English  
 FS Priority Journals  
 EM 199911  
 ED Entered STN: 20000111  
 Last Updated on STN: 20000111  
 Entered Medline: 19991110

L7 ANSWER 22 OF 38 HCAPLUS COPYRIGHT 2004 ACS on STN  
 AN 1999:496889 HCAPLUS  
 DN 132:75637  
 TI Measurement of intracellular **ATP** concentrations in vivo in bacterial cells expressing Km **mutants** of **firefly luciferase**  
 AU Squirrell, D. J.; Murphy, M. J.; Price, R. L.; White, P. J.  
 CS DERA, Salisbury, Wiltshire, SP4 0JQ, UK  
 SO Bioluminescence and Chemiluminescence: Perspectives for the 21st Century, Proceedings of the International Symposium on Bioluminescence and Chemiluminescence, 10th, Bologna, Sept. 4-8, 1998 (1999), Meeting Date 1998, 177-180. Editor(s): Roda, Aldo. Publisher: Wiley, Chichester, UK. CODEN: 67YCAD  
 DT Conference  
 LA English

RE.CNT 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD  
 ALL CITATIONS AVAILABLE IN THE RE FORMAT

L7 ANSWER 23 OF 38 BIOTECHDS COPYRIGHT 2004 THOMSON DERWENT/ISI on STN  
 DUPLICATE 9  
 AN 1999-03409 BIOTECHDS

TI Mutant luciferase with increased Km for **ATP**;  
 Photinus pyralis expression in host cell, used to determine steady  
 state or cellular **ATP** levels  
 AU Squirrell D J; White P J; Lowe C R; Murray J A  
 PA Min.Def.U.K.  
 LO Hampshire, UK.  
 PI WO 9846729 22 Oct 1998  
 AI WO 1998-GB1026 7 Apr 1998  
 PRAI GB 1997-7486 11 Apr 1997  
 DT Patent  
 LA English  
 OS WPI: 1999-080738 [07]

L7 ANSWER 24 OF 38 MEDLINE on STN DUPLICATE 10  
 AN 1999017884 MEDLINE  
 DN PubMed ID: 9799491  
 TI Site-directed **mutagenesis** of histidine 245 in **firefly**  
**luciferase**: a proposed model of the active site.  
 AU Branchini B R; Magyar R A; Murtiashaw M H; Anderson S M; Zimmer M  
 CS Department of Chemistry, Connecticut College, New London 06320, USA..  
 brbra@conncoll.edu  
 SO Biochemistry, (1998 Nov 3) 37 (44) 15311-9.  
 Journal code: 0370623. ISSN: 0006-2960.  
 CY United States  
 DT Journal; Article; (JOURNAL ARTICLE)  
 LA English  
 FS Priority Journals  
 EM 199811  
 ED Entered STN: 19990115  
 Last Updated on STN: 19990115  
 Entered Medline: 19981130

L7 ANSWER 25 OF 38 HCAPLUS COPYRIGHT 2004 ACS on STN  
 AN 1998:141871 HCAPLUS  
 TI **Mutational** analysis of a **firefly luciferase**  
 active-site peptide.  
 AU Anderson, Shannon M.; Branchini, Bruce R.  
 CS Connecticut College, New London, CT, 06320, USA  
 SO Book of Abstracts, 215th ACS National Meeting, Dallas, March 29-April 2  
 (1998), CHED-397 Publisher: American Chemical Society, Washington, D. C.  
 CODEN: 65QTAA  
 DT Conference; Meeting Abstract  
 LA English

L7 ANSWER 26 OF 38 SCISEARCH COPYRIGHT 2004 THOMSON ISI on STN DUPLICATE 11  
 AN 1998:329740 SCISEARCH  
 GA The Genuine Article (R) Number: ZJ521  
 TI Bioluminescent enzyme immunoassay using thermostable mutant luciferase and  
 acetate kinase as a labelled enzyme  
 AU Murakami S; Ito K; Goto T; Kamada S; Maeda M (Reprint)  
 CS SHOWA UNIV, SCH PHARMACEUT SCI, SHINAGAWA KU, 1-5-8 HATANODAI, TOKYO 158,  
 JAPAN (Reprint); SHOWA UNIV, SCH PHARMACEUT SCI, SHINAGAWA KU, TOKYO 158,  
 JAPAN; KIKKOMAN FOODS INC, DIV RES & DEV, NODA, CHIBA 278, JAPAN; TOSOH  
 CORP, TOKYO RES CTR, AYASE, KANAGAWA 252, JAPAN  
 CYA JAPAN  
 SO ANALYTICA CHIMICA ACTA, (31 MAR 1998) Vol. 361, No. 1-2, pp. 19-26.  
 Publisher: ELSEVIER SCIENCE BV, PO BOX 211, 1000 AE AMSTERDAM,  
 NETHERLANDS.  
 ISSN: 0003-2670.  
 DT Article; Journal  
 FS PHYS  
 LA English  
 REC Reference Count: 14  
 \*ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS\*

L7 ANSWER 27 OF 38 HCAPLUS COPYRIGHT 2004 ACS on STN  
 AN 1997:500354 HCAPLUS  
 DN 127:216960  
 TI **Mutation of protease-sensitive region in firefly luciferase** alters light emission properties  
 AU Thompson, John F.; Geoghegan, Kieran F.; Lloyd, David B.; Lanzetti, Anthony J.; Magyar, Rachelle A.; Anderson, Shannon M.; Branchini, Bruce R.  
 CS Molecular Sciences Dep., Central Res. Div., Pfizer Inc., Groton, CT, 06320, USA  
 SO Journal of Biological Chemistry (1997), 272(30), 18766-18771  
 CODEN: JBCHA3; ISSN: 0021-9258  
 PB American Society for Biochemistry and Molecular Biology  
 DT Journal  
 LA English

L7 ANSWER 28 OF 38 HCAPLUS COPYRIGHT 2004 ACS on STN  
 AN 1996:541252 HCAPLUS  
 DN 125:187591  
 TI Gene luc site-directed mutation, mutant luciferase recombinant production, and mutant luciferase reduced Km, increased heat stability, and use in luminescence assay  
 IN Squirrell, David James; Lowe, Christopher Robin; White, Peter John; Murray, James Augustus Henry  
 PA The Secretary of State for Defence, UK  
 SO PCT Int. Appl., 40 pp.  
 CODEN: PIXXD2  
 DT Patent  
 LA English  
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 9622376	A1	19960725	WO 1996-GB99	19960119
	W: AL, AM, AT, AU, AZ, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IS, JP, KE, KG, KP, KR, KZ, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI				
	RW: AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
	CA 2210354	AA	19960725	CA 1996-2210354	19960119
	AU 9643973	A1	19960807	AU 1996-43973	19960119
	AU 707243	B2	19990708		
	ZA 9600453	A	19960807	ZA 1996-453	19960119
	GB 2311525	A1	19971001	GB 1997-13482	19960119
	GB 2311525	B2	19981111		
	EP 804587	A1	19971105	EP 1996-900380	19960119
	R: CH, DE, DK, FR, GB, IT, LI, NL				
	JP 10512750	T2	19981208	JP 1996-522119	19960119
	IN 186115	A	20010623	IN 1996-DE122	19960119
	RU 2210594	C2	20030820	RU 1997-113723	19960119
	NO 9703349	A	19970919	NO 1997-3349	19970718
	US 6171808	B1	20010109	US 1997-875277	19971001
PRAI	GB 1995-1172	A	19950120		
	GB 1995-8301	A	19950424		
	WO 1996-GB99	W	19960119		

L7 ANSWER 29 OF 38 LIFESCI COPYRIGHT 2004 CSA on STN  
 AN 96:95414 LIFESCI  
 TI Extrachromosomal recombination occurs efficiently in cells defective in various DNA repair systems  
 AU Morrison, C.; Wagner, E.\*  
 CS Boehringer Ingelheim Vienna, Dr Boehringerergasse 5-11, A-1121 Vienna, Austria  
 SO NUCLEIC ACIDS RES., (1996) vol. 24, no. 11, pp. 2053-2058.  
 ISSN: 0305-1048.

DT Journal  
FS N  
LA English  
SL English

L7 ANSWER 30 OF 38 MEDLINE on STN DUPLICATE 12  
AN 96288054 MEDLINE  
DN PubMed ID: 8679773  
TI [Physicochemical properties of recombinant **luciferase** from the  
**firefly Luciola mingrelica** and its **mutant**  
forms].  
Fiziko-khimicheskie svoistva rekombinantnoi liutsiferezy svetliakov  
Luciola mingrelica i ee mutantnykh form.  
AU Dement'eva E I; Zheleznova E E; Kutuzova G D; Lundovskikh I A; Ugarova N N  
CS Faculty of Chemistry, M.V. Lomonosov Moscow State University.  
SO Biokhimiia (Moscow, Russia), (1996 Jan) 61 (1) 152-9.  
Journal code: 0372667. ISSN: 0320-9725.  
CY RUSSIA: Russian Federation  
DT Journal; Article; (JOURNAL ARTICLE)  
LA Russian  
FS Priority Journals  
EM 199608  
ED Entered STN: 19960828  
Last Updated on STN: 19980206  
Entered Medline: 19960816

=> d 27, 30 ab

L7 ANSWER 27 OF 38 HCAPLUS COPYRIGHT 2004 ACS on STN  
AB Firefly (*Photinus pyralis*) luciferase (EC 1.13.12.7) is widely used as a  
reporter enzyme in cell biol. One of its distinctive properties is a  
pronounced susceptibility to proteolytic degradation that causes luciferase to  
have a very short intracellular half-life. To define the structural basis  
for this behavior and possibly facilitate the design of more stable forms  
of luciferase, limited proteolysis studies were undertaken using trypsin  
and chymotrypsin to identify regions of the protein whose accessible and  
flexible character rendered them especially sensitive to cleavage. Regions of  
amino acid sequence 206-220 and 329-341 were found to be sensitive, and  
because the region around 206-220 had high homol. with other luciferases,  
CoA ligases, and peptidyl synthetases, this region was selected for  
mutagenesis expts. intended to determine which of its amino acids were  
essential for activity. Surprisingly, many highly conserved residues  
including Ser-198, Ser-201, Thr-202, and Gly-203 could be mutated with  
little effect on the luminescent activity of *P. pyralis* luciferase. One  
mutation, however, S198T, caused several alterations in enzymic properties  
including shifting the pH optimum from 8.1 to 8.7, lowering the Km for Mg-  
**ATP** by a factor of 4, and increasing the half-time for light  
emission decay by a factor of up to 150. Whereas S198T-luciferase was  
less active than the wild-type enzyme, activity could be restored by the  
introduction of addnl. L194F and N197Y mutations. In addition to indicating  
the involvement of this region in **ATP** binding, these results  
provide a new form of the enzyme that affords a more versatile reporter  
system.

L7 ANSWER 30 OF 38 MEDLINE on STN DUPLICATE 12  
AB Physico-chemical properties of the recombinant *L. mingrelica* luciferase  
synthesized by *E. coli* cells have been studied. The catalytic and  
spectral properties of recombinant luciferase were similar to those of the  
native enzyme but the former was less stable in the presence of the  
additional Cys residue. The **mutant** forms of *L. mingrelica*  
**firefly luciferase** with point **mutations**  
Cys-82-->Ala, Cys-260-->Ala, Cys-393-->Ala and Thr-204-->Asp, have been  
constructed using the method of site-specific mutagenesis. Mutations

Cys-82,260,393-->Ala changed slightly the Km values for **ATP** and luciferin but did not influence kcat. The Cys-393-->Ala mutant appeared to be more stable in comparison with the native enzyme. Mutation Thr-204-->Asp resulted in a 8-fold increase in the **ATP** binding constant and in a 2-fold increase in the kcat, thus indicating that Thr-204 may be located in the **ATP**-binding region of luciferase. Dithiothreitol, ethylene glycol, bovine serum albumin and trehalose had a stabilizing effect on the native, recombinant and mutant luciferases.

=> d 31-38

L7 ANSWER 31 OF 38 SCISEARCH COPYRIGHT 2004 THOMSON ISI on STN DUPLICATE 13  
 AN 96:475322 SCISEARCH  
 GA The Genuine Article (R) Number: UR714  
 TI PHYSICOCHEMICAL PROPERTIES OF RECOMBINANT **LUCIOLA-MINGRELICA-LUCIFERASE** AND ITS **MUTANT** FORMS  
 AU DEMENTIEVA E I (Reprint); ZHELEZNOVA E E; KUTUZOVA G D; LUNDOVSKIKH I A; UGAROVA N N  
 CS MOSCOW MV LOMONOSOV STATE UNIV, SCH CHEM, MOSCOW 000958, RUSSIA (Reprint)  
 CYA RUSSIA  
 SO BIOCHEMISTRY-MOSCOW, (JAN 1996) Vol. 61, No. 1, pp. 115-119.  
 ISSN: 0006-2979.  
 DT Article; Journal  
 FS LIFE  
 LA ENGLISH  
 REC Reference Count: 23  
 \*ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS\*

L7 ANSWER 32 OF 38 SCISEARCH COPYRIGHT 2004 THOMSON ISI on STN DUPLICATE 14  
 AN 95:731363 SCISEARCH  
 GA The Genuine Article (R) Number: RZ915  
 TI ENZYMATIC-PROPERTIES OF **MUTANT** THERMOSTABLE **FIREFLY LUCIFERASE** AND ITS APPLICATION TO MEASUREMENT OF ADENOSINE-TRIPHOSPHATE AND ACETATE KINASE  
 AU MURAKAMI S (Reprint); MAEDA M; TSUJI A  
 CS KIKKOMAN FOODS INC, DIV RES & DEV, 399 NODA, NODA, CHIBA 278, JAPAN (Reprint); SHOWA UNIV, SCH PHARMACEUT SCI, SHINAGAWA KU, TOKYO 142, JAPAN  
 CYA JAPAN  
 SO BUNSEKI KAGAKU, (OCT 1995) Vol. 44, No. 10, pp. 845-851.  
 ISSN: 0525-1931.  
 DT Article; Journal  
 FS PHYS  
 LA Japanese  
 REC Reference Count: 11  
 \*ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS\*

L7 ANSWER 33 OF 38 SCISEARCH COPYRIGHT 2004 THOMSON ISI on STN  
 AN 94:413524 SCISEARCH  
 GA The Genuine Article (R) Number: NU980  
 TI ENHANCEMENT OF THERMOSTABILITY OF FIREFLY LUCIFERASE FROM **LUCIOLA-LATERALIS** BY A SINGLE AMINO-ACID SUBSTITUTION  
 AU KAJIYAMA N (Reprint); NAKANO E  
 CS KIKKOMAN FOODS INC, DIV RES & DEV, 399 NODA, NODA, CHIBA 278, JAPAN (Reprint)  
 CYA JAPAN  
 SO BIOSCIENCE BIOTECHNOLOGY AND BIOCHEMISTRY, (JUN 1994) Vol. 58, No. 6, pp. 1170-1171.  
 ISSN: 0916-8451.  
 DT Note; Journal  
 FS LIFE; AGRI  
 LA ENGLISH  
 REC Reference Count: 10  
 \*ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS\*

L7 ANSWER 34 OF 38 LIFESCI COPYRIGHT 2004 CSA on STN DUPLICATE 15  
 AN 93:124804 LIFESCI  
 TI Bioluminescence detection system of **mutagen** using  
**firefly luciferase** genes introduced in Escherichia coli  
 lysogenic strain.  
 AU Lee, S.M.; Suzuki, M.; Kumagai, M.; Ikeda, H.; Tamiya, E.; Karube, I.  
 CS Res. Cent. Adv. Sci. and Technol., Univ. Tokyo, 4-6-1 Komaba, Meguro-ku,  
 Tokyo, 153, Japan  
 SO ANAL. CHEM., (1992) vol. 64, no. 17, pp. 1755-1759.  
 ISSN: 0003-2700.  
 DT Journal  
 FS J; G  
 LA English  
 SL English

L7 ANSWER 35 OF 38 LIFESCI COPYRIGHT 2004 CSA on STN  
 AN 93:112169 LIFESCI  
 TI Engineering firefly luciferase as an indicator of cyclic AMP-dependent  
 protein kinase in living cells.  
 AU Sala-Newby, G.; Campbell, A.K.  
 CS Dep. Med. Biochem., Univ. Wales Coll. Med., Heath Park, Cardiff CF4 4XN,  
 UK  
 SO FEBS LETT., (1992) vol. 307, no. 2, pp. 241-244.  
 ISSN: 0014-5793.  
 DT Journal  
 FS L  
 LA English  
 SL English

L7 ANSWER 36 OF 38 BIOTECHDS COPYRIGHT 2004 THOMSON DERWENT/ISI on STN  
 DUPLICATE 16  
 AN 1991-15060 BIOTECHDS  
 TI New mutant luciferase polypeptide or enzyme;  
 firefly gene cloning and expression in Escherichia coli; use in  
**ATP** analysis; DNA sequence  
 PA Kikkoman  
 PI EP 449621 2 Oct 1991  
 AI EP 1991-302717 27 Mar 1991  
 PRAI JP 1990-294258 30 Oct 1990; JP 1990-75696 27 Mar 1990  
 DT Patent  
 LA English  
 OS WPI: 1991-290027 [40]

L7 ANSWER 37 OF 38 BIOTECHDS COPYRIGHT 2004 THOMSON DERWENT/ISI on STN  
 AN 1991-11942 BIOTECHDS  
 TI Isolation and characterization of **mutants** of **firefly**  
**luciferase** which produce different colors of light;  
 enzyme engineering; single amino acid substitution results in green,  
 red, yellow-orange, orange light-producing enzyme; potential  
 application **ATP** detection using luminescence  
 AU Kajiyama N; Nakano E  
 CS Kikkoman  
 LO Research and Development Division, Kikkoman Corporation, 399 Noda,  
 Noda-City, Chiba 278, Japan.  
 SO Protein Eng.; (1991) 4, 6, 691-93  
 CODEN: PRENE9  
 DT Journal  
 LA English

L7 ANSWER 38 OF 38 EMBASE COPYRIGHT 2004 ELSEVIER INC. ALL RIGHTS RESERVED.  
 on STN DUPLICATE 17  
 AN 85195382 EMBASE  
 DN 1985195382

TI Determination of picomole amounts of glycerate 3-phosphate, glycerate 2-phosphate, and phosphoenol pyruvate by an enzymatic assay coupled to firefly luciferase/luciferin luminescence.  
 AU Lilly McC. R.; Grahame P.K.; Ali S.R.M.  
 CS Department of Biology, University of Wollongong, Wollongong, NSW 2500, Australia  
 SO Analytical Biochemistry, (1985) 148/2 (282-287).  
 CODEN: ANBCA2  
 CY United States  
 DT Journal  
 FS 029 Clinical Biochemistry  
 LA English

=> d 31-38 ab

L7 ANSWER 31 OF 38 SCISEARCH COPYRIGHT 2004 THOMSON ISI on STN DUPLICATE 13

AB Physicochemical properties of recombinant *L. mingrelica* luciferase synthesized by *E. coli* cells were studied. The catalytic and spectral properties of the recombinant luciferase were similar to those of the native one, but the former was less stable due to the presence of an additional Cys residue. **Mutant** forms of *L. mingrelica* **firefly luciferase** with point **mutations** Cys-82-->Ala, Cys-260-->Ala, Cys-393-->Ala, and Thr-204-->Asp were constructed using the method of site-specific mutagenesis. Cys-82,260,393-->Ala mutations changed slightly the K-m for **ATP** and luciferin but did not influence k(cat). The Cys-393-->Ala mutant appeared to be more stable than the native luciferase. Mutation Thr-204-->Asp resulted in a 8-fold increase in the **ATP** binding constant and a 2-fold increase in k(cat), indicating that Thr-204 may be located in the **ATP**-binding region of the luciferase. Dithiothreitol, ethylene glycol, bovine serum albumin, and trehalose had a stabilizing effect on the native, recombinant, and mutant luciferases.

L7 ANSWER 32 OF 38 SCISEARCH COPYRIGHT 2004 THOMSON ISI on STN DUPLICATE 14

AB We have purified thermostable **mutant firefly luciferases** obtained by random and site specific **mutagenesis** from *Luciola cruciata* and *Luciola lateralis* in which the amino acid residue at position 217 was changed from Thr to Ile or Leu, and Ala to Leu, respectively. Optimal pH and K-m values of three **mutant firefly luciferases** were found to be similar to those of wild type luciferase. But mutant luciferases were superior to wild type luciferase in thermal and pH stability. In these mutant, Ala217Leu mutant luciferase was most stable with 50% of the activity remaining after heating at 50 degrees C for 20 min. Because of its high productivity, we applied Thr217Ile mutant luciferase to the bioluminescent assay of adenosine triphosphate (**ATP**) and acetate kinase (AK). The bioluminescent assay for **ATP** ranged from  $2.0 \times 10^{-14}$  M to  $2.0 \times 10^{-10}$  M. The bioluminescent assay of AK was done by firefly-luciferase, measuring **ATP** produced by the enzymatic reaction of AK using acetyl phosphate and ADP as substrate. The detection limit of AK was 8.6 zmol/assay (5200 molecules) and the relative standard deviation (RSD, n=6) for each point ranged from 1.5 to 5.6%. Thus thermostable mutant luciferase is useful for bioluminescent determination of **ATP**, and especially for detection of **ATP** producing enzyme activity.

L7 ANSWER 33 OF 38 SCISEARCH COPYRIGHT 2004 THOMSON ISI on STN

AB We constructed **firefly luciferase mutants** from *Luciola lateralis* in which Ala at position 217 was replaced by each of three hydrophobic amino acid residues (Ile, Leu, and Val). These mutants were superior to the wild-type in thermostability. Especially, the purified Ala217Leu mutant still maintained over 70% of the initial activity after 60 min at 50 degrees C. This **mutant** is

the most thermostable **firefly luciferase** obtained.

- L7 ANSWER 34 OF 38 LIFESCI COPYRIGHT 2004 CSA on STN DUPLICATE 15  
AB A rapid and convenient microbial sensing system for mutagens was developed based upon the induction of prophage from *Escherichia coli* lysogenic strain and bioluminescence. The system consisted of lysogenic *E. coli* encoding firefly luciferase genes and a photodetection system. Measurement of mutagen mitomycin C was achieved by measuring the luminescence intensity emitted from *E. coli* lysogenic strain for the recombinant phage in the presence of luminescence substrates. Approximately 1 h after addition of mitomycin C, the luminescence began to be observed, and 3 h after, it attained a level of 2 times greater than that of 1 h. Irradiation with ultraviolet light also produced light based on induction of phage from the *E. coli* lysogenic strain for the recombinant phage. When nonmutagenic toxic compounds like sodium azide were added to the reaction medium, luminescence was not observed. Mitomycin C could be detected within 1 h with this sensing system, at concentrations down to 10 super(2) ng/assay.
- L7 ANSWER 35 OF 38 LIFESCI COPYRIGHT 2004 CSA on STN  
AB A bioluminescent indicator for protein kinase A has been developed by **mutating** V217 in **firefly** (*Photinus pyralis*) **luciferase** to R, and the C-terminal peroxisomal signal removed by PCR. The cDNA for normal and the RRFS mutant luciferase were inserted into pSV7d and expressed in COS-7 cells. The cyclic-AMP analogue, 8-(4-chlorophenylthio)-cyclic AMP caused a 5-10% decrease in light emission within 4 min in COS cells expressing the RRFS mutant, but not in cells expressing normal luciferase. This provides for the first time an indicator for detecting and quantifying protein kinase A activation in living cells.
- L7 ANSWER 36 OF 38 BIOTECHDS COPYRIGHT 2004 THOMSON DERWENT/ISI on STN  
AB A new **mutant firefly luciferase** (EC-1.13.12.7) contains the following amino acid replacements: Val-233 by Ile; Val-239 by Ile; Ser-286 by Asn; Gly-326 by Ser; His-433 by Tyr; and/or Pro-452 by Ser. The following are also new: a mutant luciferase gene encoding the enzyme; recombinant DNA containing the gene; a method for producing recombinant mutant luciferase by culture of recombinant *Escherichia coli* FERM BP-2825, FERM BP-2826, FERM BP-3135, FERM BP-3136, FERM BP-3137 or FERM BP-3138; in vitro **mutagenesis** of a wild-type **firefly luciferase** gene using a chemical **mutagen**; and an **ATP** assay kit containing the luciferase mutant and luciferin, to measure the amount of **ATP** in colored solutions by production of red, orange or green light, at a different wavelength from that produced by native luciferase (609 and 612 nm, 595 and 607 nm, or 558 nm, respectively). The wild-type luciferase gene may be isolated from e.g. *Luciola cruciata*, *Luciola lateralis*, *Photinus pyralis*, etc. The new luciferase is industrially useful, and may be used to measure **ATP** in e.g. blood, where native luciferase does not provide reliable results. (20pp)
- L7 ANSWER 37 OF 38 BIOTECHDS COPYRIGHT 2004 THOMSON DERWENT/ISI on STN  
AB Plasmid pGLf37 containing luciferase (EC-1.13.12.7) cDNA from the 'Genji' firefly, *Luciola cruciata* was treated with 0.8 M hydroxylamine, 0.1 M sodium phosphate and 1 mM EDTA, pH 6.0, for 2 hr at 65 deg. The mutagen-treated plasmid was used to transform *Escherichia coli* JM101. *E. coli* JM101 cells harboring the mutant plasmid were cultivated, lysed and lysates were fractionated, precipitated and subjected to gel filtration on an Ultrogel ACA34 column. Some of the isolated mutant enzymes produced different colors of light, ranging from green to red. 5 Such mutants, producing green ( $\lambda_{max}$  = 558 nm), yellow-orange ( $\lambda_{max}$  = 595 nm), orange ( $\lambda_{max}$  = 607 nm) and red light ( $\lambda_{max}$  = 609 and 612 nm), were analyzed. The mutations were single amino acid changes, from Val-239 to Ile, Pro-452 to Ser, Ser-286 to Asn, Gly-326 to

Ser and His-433 to Tyr, respectively. These mutant enzymes could be used more effectively for determining the amount of **ATP** in colored samples. In the case of red-colored samples, determination was twice as sensitive using the mutant enzyme producing red light than with wild-type luciferase. (15 ref)

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on STN

AB A procedure for the determination of picomole amounts of glycerate 3-phosphate, glycerate 2-phosphate, and phosphoenol pyruvate is described. These metabolites were utilized by the glycolytic enzymes phosphoglycerate mutase, enolase, and pyruvate kinase to generate **ATP** which was determined by **firefly luciferase**/luciferin luminescence. The phosphoglycerate **mutase** used was of the glycerate 2,3-bisphosphate-independent type and was prepared from wheat germ. Stoichiometric conversion of glycerate 3-P, ranging in amount from 9 to 275 pmol, occurred after 25 min preincubation and required a narrow range of added mutase. The application of the procedure for determining these metabolites in suspensions of plant protoplasts is described.

=> dis his

(FILE 'HOME' ENTERED AT 18:56:20 ON 20 JUL 2004)

FILE 'MEDLINE, SCISEARCH, LIFESCI, BIOTECHDS, BIOSIS, EMBASE, HCAPLUS, NTIS, ESBIODBASE, BIOTECHNO, WPIDS' ENTERED AT 18:56:36 ON 20 JUL 2004

L1 11631 S LUCIFERASE (10A) (FIREFLY OR LUCIOLA)  
L2 356 S L1 (5A) (MUTA? OR VARIANT)  
L3 128 DUP REM L2 (228 DUPLICATES REMOVED)  
L4 1 S L2 AND 490  
L5 94 S L2 AND ATP  
L6 93 S L5 NOT L4  
L7 38 DUP REM L6 (55 DUPLICATES REMOVED)

=> log h

COST IN U.S. DOLLARS	SINCE FILE	TOTAL
	ENTRY	SESSION
FULL ESTIMATED COST	106.38	106.59
DISCOUNT AMOUNTS (FOR QUALIFYING ACCOUNTS)	SINCE FILE	TOTAL
	ENTRY	SESSION
CA SUBSCRIBER PRICE	-1.47	-1.47

SESSION WILL BE HELD FOR 60 MINUTES  
STN INTERNATIONAL SESSION SUSPENDED AT 19:10:36 ON 20 JUL 2004

## WEST Search History

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DATE: Tuesday, July 20, 2004

Hide?	Set Name	Query	Hit Count
	<i>DB=PGPB,USPT,USOC,EPAB,JPAB,DWPI; PLUR=YES; OP=ADJ</i>		
<input type="checkbox"/>	L5	L4 not l2	26
<input type="checkbox"/>	L4	L1 and 490	28
<input type="checkbox"/>	L3	L1 with 490	0
<input type="checkbox"/>	L2	L1 and heike	6
<input type="checkbox"/>	L1	luciferase with firefly with (muta\$ or variant)	114

END OF SEARCH HISTORY

## Hit List

### Search Results - Record(s) 1 through 6 of 6 returned.

☐ 1. Document ID: US 6171808 B1

Using default format because multiple data bases are involved.

L2: Entry 1 of 6

File: USPT

Jan 9, 2001

US-PAT-NO: 6171808

DOCUMENT-IDENTIFIER: US 6171808 B1

TITLE: Mutant luciferases

DATE-ISSUED: January 9, 2001

#### INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Squirrell; David J	Salisbury			GB
Lowe; Christopher R	Cambridge			GB
White; Peter J	Cambridge			GB
Murray; James A H	Cambridge			GB

US-CL-CURRENT: 435/8; 435/189, 435/252.3, 435/252.33, 435/254.21, 435/320.1,  
536/23.2

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KMC	Draw D
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☐ 2. Document ID: US 6132983 A

L2: Entry 2 of 6

File: USPT

Oct 17, 2000

US-PAT-NO: 6132983

DOCUMENT-IDENTIFIER: US 6132983 A

TITLE: Luciferases

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KMC	Draw D
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☐ 3. Document ID: US 6074859 A

L2: Entry 3 of 6

File: USPT

Jun 13, 2000

US-PAT-NO: 6074859

DOCUMENT-IDENTIFIER: US 6074859 A

TITLE: Mutant-type bioluminescent protein, and process for producing the mutant-type bioluminescent protein

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KWIC	Drawn De
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☐ 4. Document ID: US 5843746 A

L2: Entry 4 of 6

File: USPT

Dec 1, 1998

US-PAT-NO: 5843746

DOCUMENT-IDENTIFIER: US 5843746 A

TITLE: Biotinated firefly luciferase, a gene for biotinated firefly luciferase, a recombinant DNA, a process for producing biotinated luciferase and a bioluminescent analysis method

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KWIC	Drawn De
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☐ 5. Document ID: US 5814465 A

L2: Entry 5 of 6

File: USPT

Sep 29, 1998

US-PAT-NO: 5814465

DOCUMENT-IDENTIFIER: US 5814465 A

TITLE: Biotinated firefly luciferase, a gene for biotinated firefly luciferase, a recombinant DNA, a process for producing biotinated luciferase and a bioluminescent analysis method

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KWIC	Drawn De
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☐ 6. Document ID: US 5229285 A

L2: Entry 6 of 6

File: USPT

Jul 20, 1993

US-PAT-NO: 5229285

DOCUMENT-IDENTIFIER: US 5229285 A

TITLE: Thermostable luciferase of firefly, thermostable luciferase gene of firefly, novel recombinant DNA, and process for the preparation of thermostable luciferase of firefly

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NO:10, the luciferase of *Luciola cruciata* of SEQ ID NO:12, the luciferase of *Luciola lateralis* of SEQ ID NO:14, and the luciferase of *Luciola mingrelica* of SEQ ID NO:16.

6. An isolated DNA molecule according to claim 2 wherein, for the encoded amino acid sequence, the corresponding wild-type luciferase is selected from the group consisting of LucPplGR of SEQ ID NO:2, LucPplYG of SEQ ID NO:4, LucPplYE of SEQ ID NO:6, LucPplOR of SEQ ID NO:8, the luciferase of *Photinus pyralis* of SEQ ID NO:10, the luciferase of *Luciola cruciata* of SEQ ID NO:12, the luciferase of *Luciola lateralis* of SEQ ID NO:14, and the luciferase of *Luciola mingrelica* of SEQ ID NO:16.

7. An isolated DNA molecule according to claim 3 wherein, for the encoded amino acid sequence, the corresponding wild-type luciferase is selected from the group consisting of LucPplGR of SEQ ID NO:2, LucPplYG of SEQ ID NO:4, LucPplYE of SEQ ID NO:6, LucPplOR of SEQ ID NO:8, the luciferase of *Photinus pyralis* of SEQ ID NO:10, the luciferase of *Luciola cruciata* of SEQ ID NO:12, the luciferase of *Luciola lateralis* of SEQ ID NO:14, and the luciferase of *Luciola mingrelica* of SEQ ID NO:16.

8. An isolated DNA molecule according to claim 4 wherein, for the encoded amino acid sequence, the corresponding wild-type luciferase is selected from the group consisting of LucPplGR of SEQ ID NO:2, LucPplYG of SEQ ID NO:4, LucPplYE of SEQ ID NO:6, LucPplOR of SEQ ID NO:8, the luciferase of *Photinus pyralis* of SEQ ID NO:10, the luciferase of *Luciola cruciata* of SEQ ID NO:12, the luciferase of *Luciola lateralis* of SEQ ID NO:14, and the luciferase of *Luciola mingrelica* of SEQ ID NO:16.

9. An isolated DNA molecule according to claim 5 wherein, for the encoded amino acid sequence, the corresponding wild-type luciferase is selected from the group consisting of LucPplGR of SEQ ID NO:2, LucPplYG of SEQ ID NO:4, LucPplYE of SEQ ID NO:6, and LucPplOR of SEQ ID NO:8.

10. An isolated DNA molecule according to claim 6 wherein, for the encoded amino acid sequence, the corresponding wild-type luciferase is selected from the group consisting of LucPplGR of SEQ ID NO:2, LucPplYG of SEQ ID NO:4, LucPplYE of SEQ ID NO:6, LucPplOR of SEQ ID NO:8.

11. An isolated DNA molecule according to claim 7 wherein, for the encoded amino acid sequence, the corresponding wild-type luciferase is selected from the group consisting of LucPplGR of SEQ ID NO:2, LucPplYG of SEQ ID NO:4, LucPplYE of SEQ ID NO:6, and LucPplOR of SEQ ID NO:8.

12. An isolated DNA molecule according to claim 8 wherein, for the encoded amino acid sequence, the corresponding wild-type luciferase is selected from the group consisting of LucPplGR of SEQ ID NO:2, LucPplYG of SEQ ID NO:4, LucPplYE of SEQ ID NO:6, LucPplOR of SEQ ID NO:8.

13. An isolated DNA molecule according to claim 9 wherein, for the encoded amino acid sequence, the corresponding wild-type luciferase is LucPplGR of SEQ ID NO:2.

14. An isolated DNA molecule according to claim 10 wherein, for the encoded amino acid sequence, the corresponding wild-type luciferase is LucPplGR of SEQ ID NO:2.

15. An isolated DNA molecule according to claim 11 wherein, for the encoded amino acid sequence, the corresponding wild-type luciferase is LucPplGR of SEQ ID NO:2.

16. An isolated DNA molecule according to claim 12 wherein, for the encoded amino acid sequence, the corresponding wild-type luciferase is LucPplGR of SEQ ID NO:2.

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17. An isolated DNA molecule according to claim 13 wherein the encoded synthetic mutant luciferase is selected from the group consisting of LucPplGR -R<sub>215</sub>II, -R<sub>215</sub>G, -R<sub>215</sub>T, -R<sub>215</sub>M, -R<sub>215</sub>P, -R<sub>215</sub>A, -R<sub>215</sub>L, -V<sub>224</sub>L, -V<sub>224</sub>S, -V<sub>224</sub>F, -V<sub>224</sub>Y, -V<sub>224</sub>L, -V<sub>224</sub>H, -V<sub>224</sub>G, -V<sub>224</sub>E, -V<sub>236</sub>H, -V<sub>236</sub>W, -Y<sub>237</sub>S, -Y<sub>237</sub>C, -H<sub>242</sub>A, -F<sub>244</sub>L, -G<sub>245</sub>S, -G<sub>245</sub>E, -I<sub>248</sub>R, -I<sub>248</sub>V, -I<sub>248</sub>F, -I<sub>248</sub>T, -S<sub>247</sub>F/I<sub>248</sub>T, -V<sub>224</sub>F/R<sub>215</sub>G, -V<sub>224</sub>F/R<sub>215</sub>T, -V<sub>224</sub>F/R<sub>215</sub>V, -V<sub>227</sub>F/R<sub>215</sub>P, -V<sub>224</sub>F/P<sub>222</sub>S, -V<sub>224</sub>F/Q<sub>227</sub>E, -V<sub>224</sub>F/L<sub>238</sub>V, -V<sub>224</sub>F/L<sub>238</sub>T, -V<sub>224</sub>F/S<sub>247</sub>G, -V<sub>224</sub>F/S<sub>247</sub>H, -V<sub>224</sub>F/S<sub>247</sub>T, and -V<sub>224</sub>F/S<sub>247</sub>F.

18. An isolated DNA molecule according to claim 1, wherein the position of the amino acid substitution corresponds to position 215 in the amino acid sequence of LucPplGR of SEQ ID NO:2.

19. An isolated DNA molecule according to claim 1, wherein the position of the amino acid substitution corresponds to position 224 in the amino acid sequence of LucPplGR of SEQ ID NO:2.

20. An isolated DNA molecule according to claim 1, wherein the position of the amino acid substitution corresponds to position 232 in the amino acid sequence of LucPplGR of SEQ ID NO:2.

21. An isolated DNA molecule according to claim 1, wherein the position of the amino acid substitution corresponds to position 236 in the amino acid sequence of LucPplGR of SEQ ID NO:2.

22. An isolated DNA molecule according to claim 1, wherein the position of the amino acid substitution corresponds to position 237 in the amino acid sequence of LucPplGR of SEQ ID NO:2.

23. An isolated DNA molecule according to claim 1, wherein the position of the amino acid substitution corresponds to position 242 in the amino acid sequence of LucPplGR of SEQ ID NO:2.

24. An isolated DNA molecule according to claim 1, wherein the position of the amino acid substitution corresponds to position 244 in the amino acid sequence of LucPplGR of SEQ ID NO:2.

25. An isolated DNA molecule according to claim 1, wherein the position of the amino acid substitution corresponds to position 245 in the amino acid sequence of LucPplGR of SEQ ID NO:2.

26. An isolated DNA molecule according to claim 1, wherein the position of the amino acid substitution corresponds to position 248 in the amino acid sequence of LucPplGR of SEQ ID NO:2.

27. An isolated DNA molecule comprising a segment having a sequence which encodes a synthetic mutant beetle luciferase having an amino acid sequence that differs from that of the corresponding wild-type luciferase by at least one amino acid substitution, the position of the amino acid substitution corresponding to position 282 in the amino acid sequence of LucPplGR of SEQ ID NO:2, wherein the mutant luciferase produces bioluminescence having a shift in wavelength of peak intensity of at least 1 nanometer relative to the bioluminescence produced by the wild-type luciferase.

28. An isolated DNA molecule comprising a segment having a sequence which encodes a synthetic mutant beetle luciferase having an amino acid sequence that differs from that of the corresponding wild-type luciferase by at least one amino acid substitution, the position of the amino acid substitution corresponding to position 283 in the amino acid sequence of LucPplGR of SEQ ID NO:2, wherein the mutant luciferase produces bioluminescence having a shift in wavelength of peak intensity of at least 1 nanometer relative to the bioluminescence produced by the wild-type luciferase.